
*The effects of Onychiurus subtenuis on the microbial
decomposition of Populus tremuloides leaf litter*

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Spore tracking experiments in which *Onychiurus subtenuis* from the soil and litter layers of a cool temperate *Populus tremuloides* woodland were released onto sterile agar plates, showed that this Collembola carried over 130 different species of fungi and that there were distinct differences in species composition of the fungal load carried from each of the L-F- and H-layers.

In order to determine whether the fungi carried from the lower layers were capable of colonizing and metabolizing leaves which had been in the L-layer for 10 months, microbial metabolism was monitored by incubating leaves with and without Collembola in laboratory microcosms. When 0.5 g air-dried leaves were remoistered to 70 % water content, autoclaved and 10 Collembola from the F-layer introduced for only 24 hours, significantly higher levels of carbon dioxide were recorded over the following weeks than for the control sterile leaves. When the Collembola were left on the leaves for 28 days so that further spore dispersal and also grazing could occur, significantly greater rates of CO₂ output were observed. These experiments showed that spores carried by the animals could colonize and metabolize the L-layer litter.

The experiment was repeated using air-dried litter remoistered to 70 % water content but not autoclaved so that they retained a diverse negative microbial community. Under these conditions neither the initial inoculation nor subsequent dispersal and grazing of the micro-organisms by the Collembola clearly accelerated rates of carbon metabolism.

It was concluded that the rapid migrations of *O. subtenuis* from H- and F- into the L-layer do promote spore dispersal but that under the conditions of high microbial competition existing in the L-layer material used the effects of this in stimulating decomposition rates are negligible.

